

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An autonomous monitoring apparatus for monitoring air, ~~water, soil, or other substance~~ for bioagents wherein the air may contain potential bioagent particles, comprising:

a collector for gathering said air, ~~water, soil, or other substance~~ being monitored, said collector separating selected potential bioagent particles from said air, ~~water, soil, or other substance~~;

a wetted wall sample preparation means preparer for preparing a sample of said selected potential bioagent particles, said wetted wall sample preparation means preparer operatively connected to said collector for collecting and preparing said sample from said air, ~~water, soil, or other substance~~ gathered by said collector,

wherein said wetted wall sample preparer includes a wetted wall cyclone collector that concentrates said selected potential bioagent particles in a liquid and a unit for adding optically encoded microbeads imbedded with precise ratios of red and orange fluorescent dyes yielding an array of beads having a unique spectral address and each bead coated with capture antibodies specific for a given antigen to said liquid and said selected potential bioagent particles;  
and

a detector for detecting said bioagents in said sample, said detector operatively connected to said wetted wall sample preparation means preparer wherein said detector ~~is a liquid array based multiplex immunoassay detector that~~ utilizes said optically encoded microbeads and

wherein said detector includes a flow cytometer for analyzing said optically encoded microbeads that are imbedded with precise ratios of red and orange fluorescent dyes yielding an array of beads, ~~each with~~ having a unique

spectral address and each bead is coated with capture antibodies specific for a given antigen with a laser unit for individually interrogating said optically encoded microbeads and detecting said bioagents.

2. (Original) The apparatus of claim 1 wherein said collector is an aerosol collector.

3. (Currently Amended) The apparatus of claim 1 wherein said ~~air, water, soil, or other substance~~ includes other particles in addition to said potential bioagent particles and wherein said collector includes a separator means for separating said potential bioagent particles from said other particles.

4. (Original) The apparatus of claim 3 wherein said potential bioagent particles are of a predetermined size range and said separator separates said potential bioagent particles are of a predetermined size range from said other particles.

5. (Original) The apparatus of claim 4 wherein said collector is an aerosol collector that collects air and includes means for separating said air into a bypass air flow that does not contain said potential bioagent particles of a predetermined particle size range and a product air flow that contains said potential bioagent particles of a predetermined particle size range.

6. (Cancelled)

7. (Cancelled).

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Currently Amended) The apparatus of claim 1 wherein said potential bioagent particles contain spores and including sample preparation means ~~includes~~ means for lysis of said spores ~~in said air, water, soil, or other substance.~~

13. (Cancelled)

14. (Cancelled)

15. (Currently Amended) The apparatus of claim 14 ~~1~~ wherein said ~~means~~ ~~for injecting and/or aspirating said sample comprises~~ wetted wall sample preparer includes a sequential injection analysis system.

16. (Currently Amended) The apparatus of claim 14 ~~1~~ wherein said ~~means~~ ~~for injecting and/or aspirating said sample comprises~~ wetted wall sample preparer includes a flow injection analysis system.

17. (Cancelled)

18. (Cancelled)

19. (Currently Amended) The apparatus of claim 14 ~~1~~ wherein said ~~means~~ ~~for mixing said sample and the reagent~~ wetted wall sample preparer includes a super serpentine reactor.

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (Cancelled)

26. (Cancelled)

27. (Previously Presented) The apparatus of claim 1 wherein said optically encoded microbeads are polystyrene beads.

28. (Cancelled)

29. (Currently Amended) The apparatus of claim 1 ~~including a~~ wherein said flow cytometer for analyzing said optically encoded microbeads with said laser unit includes a red laser that classifies said microbeads and a green laser that quantifies said microbeads.

30. (Cancelled)

31. (Currently Amended) The apparatus of claim 1 wherein said detector ~~is~~ includes a liquid-array based multiplex immunoassay detector.

32. (Currently Amended) The apparatus of claim 1 wherein said detector ~~is~~ includes a multiplex PCR detector.

33. (Original) The apparatus of claim 1 including confirmation means for confirming said bioagents in said sample.

34. (Original) The apparatus of claim 33 wherein said confirmation means is a multiplex immunoassay detector.

35. (Original) The apparatus of claim 33 wherein said confirmation means is a multiplex PCR detector.

36. (Original) The apparatus of claim 33 wherein said confirmation means is a real time PCR detector.

37. (Original) The apparatus of claim 33 wherein said confirmation means includes means for performing PCR amplification.

38. (Original) The apparatus of claim 33 wherein said confirmation means includes means for injecting/aspirating a sample, means for adding PCR reagent, means for mixing sample and reagent, means for transport to PCR reactor, means for performing PCR amplification, means for transport of amplified sample from PCR reactor, and means for detection of PCR amplicon.

39. (Original) The apparatus of claim 33 wherein said confirmation means includes means for injecting/aspirating a sample, means for adding PCR reagent, means for mixing sample and reagent, means for transport to PCR reactor, means for performing PCR amplification, means for transport of amplified sample from PCR reactor, means for detection of PCR amplicon, and means for decontamination and conditioning of all exposed conduits.

40. (Original) The apparatus of claim 1 wherein said sample preparation means includes optically encoded microbeads and bead suspension/mixer means for suspending said microbeads for a predetermined time period.

41. (Withdrawn) A method of monitoring air, water, soil, or other substance for bioagents, said air, water, soil, or other substance containing potential bioagent particles of various sizes, comprising the steps of:

gathering said air, water, soil, or other substance containing potential bioagent particles of various sizes;

separating said potential bioagent particles by size and collecting said potential bioagent particles of a size range that are likely to contain said bioagents; and

detecting said bioagents in said potential bioagent particles of a size range that are likely to contain said bioagents.

42. (Withdrawn) The method of claim 41 wherein said step of separating said potential bioagent particles by size and collecting said potential bioagent particles of a size range that are likely to contain said bioagents comprises separating said air into a bypass air flow that does not contain said potential bioagent particles of a size range that are likely to contain said bioagents and a product air flow that does contain said potential bioagent particles of a size range that are likely to contain said bioagents.

43. (Withdrawn) The method of claim 41 wherein said step of separating said potential bioagent particles by size and collecting said potential bioagent particles of a size range that are likely to contain said bioagents includes the step of concentrating said potential bioagent particles of a size range that are likely to contain said bioagents in a liquid.

44. (Withdrawn) The method of claim 41 wherein said step of detecting said bioagents comprises mixing optically encoded microbeads with said

potential bioagent particles and detecting said bioagents with said optically encoded microbeads.

45. (Withdrawn) The method of claim 41 wherein said step of detecting said bioagents comprises mixing optically encoded microbeads coded with antibodies with said potential bioagent particles and detecting said bioagents with said and detecting said bioagents with said optically encoded microbeads coded with antibodies.

46. (Withdrawn) The method of claim 41 wherein said step of detecting said bioagents comprises mixing optically encoded microbeads coded with fluorescently labeled antibodies with said potential bioagent particles and detecting said bioagents with said and detecting said bioagents with said optically encoded microbeads coded with fluorescently labeled antibodies.

47. (Withdrawn) The method of claim 41 wherein said step of detecting said bioagents comprises mixing optically encoded microbeads color coded with color emitting dyes with said potential bioagent particles and detecting said bioagents with said optically encoded microbeads.

48. (Withdrawn) The method of claim 41 wherein said step of detecting said bioagents comprises mixing optically encoded microbeads with said potential bioagent particles and analyzing said optically encoded microbeads in a flow cytometer.

49. (Withdrawn) The method of claim 41 including the step of confirming said bioagents.

50. (Withdrawn) The method of claim 41 including the step of confirming said bioagents by adding PCR reagent to said potential bioagent particles, performing PCR amplification on said potential bioagent particles, and detecting PCR amplicon in said potential bioagent particles.